

MINNESOTA ECONOMIC

# TRENDS



## THE COST OF COLLEGE

ASSESSING THE VALUE  
OF HIGHER EDUCATION

SEPTEMBER 2016

**m** MINNESOTA  
EMPLOYMENT AND  
ECONOMIC DEVELOPMENT



# Embracing Older Workers

One wild card in the labor market in coming years will be how many older workers choose to stay on the job beyond traditional retirement age.

The trend is already skewing toward an older workforce in the state. According to Cameron Macht's story that begins on page 12 of this issue, workers 55 and over now fill 20 percent of the jobs in Minnesota. Just a decade ago that age group held 13.5 percent of the state's jobs.

The workforce in virtually every region and industry in the state is aging. As more of those workers retire and leave the workforce, many employers will struggle to find replacements. That point was underscored by DEED's recent Job Vacancy Survey, which showed Minnesota had nearly 98,000 unfilled job openings in the second quarter, among the most since the agency began tracking job vacancies 15 years ago.

Breaking down employment and education barriers that have kept people of color, younger adults and people with disabilities out of the workforce is one part of the formula for responding to the tighter labor market in the state.

But embracing older workers – from offering more flexible work hours to better benefits, part-time options or training opportunities – also will help address the challenge. Companies that make it a priority to hire and retain older workers will have an advantage in the growing competition for talent.

A handwritten signature in black ink that reads "Monte Hanson". The signature is fluid and cursive.

**Monte Hanson**  
Editor



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# What to Know Before You Owe

*Earning a post-secondary degree can offer lifelong benefits, but it comes with a cost.*

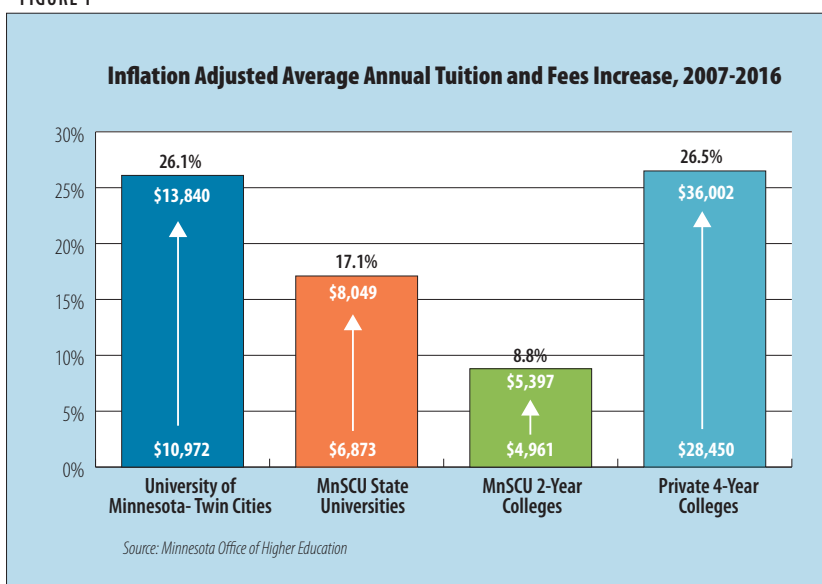
Higher education is considered the gold standard for increased earnings potential and quality of life. The rapidly rising cost of higher education, however, has left many wondering if college is worth the cost.

To be sure, Minnesota's highly educated workforce comes with a price. The state ranks third highest in the nation for the percentage of students holding student debt (70 percent) and fifth for average student debt (\$31,579 at four-year institutions in 2014). At the same time, Minnesota boasts the fourth-highest share of residents (65.9 percent) who have achieved some amount of higher education, behind Colorado, Utah and Washington.

Overall, post-secondary education provides workers with a competitive advantage in the workplace, but it can be a disadvantage in the financial stability of these workers as well. This article looks at the short-term and long-term costs of education and adds in the basic cost of living as a benchmark for financial success.



FIGURE 1



## Costs and Benefits

Higher education often brings significant benefits, such as increased earnings and job opportunities, along with newly minted skills and knowledge. The price for this expanded horizon has become increasingly more costly, however. From 2007 to 2016, the cost of attending the University of Minnesota-Twin Cities rose 26.5 percent. During that same period, the cost of tuition at two-year Minnesota State (formerly MnSCU) institutions rose 8.8 percent (see Figure 1).

While tuition and fees were increasing much faster than inflation, median earnings for Minnesota workers did not

keep pace, even for those with college degrees. Obviously the Great Recession greatly affected income growth during this period. Even in the decade prior, tuition and fees rose faster than median earnings. In other words, the cost of higher education increased faster than the growth in wages for people with college degrees.

As the cost of attending college has increased, so has the share of Minnesotans with student loan debt. More telling is the amount and share of Minnesotans with severely delinquent student loan debt. With about one in nine higher education borrowers now behind on payments, it appears that there is not enough

awareness about the cost of education or a misperception of its financial benefit (see Figure 2).

## How Much Should You Borrow?

This basic question quickly becomes complex, since the method of financing higher education has a profound effect on the total cost and the lifetime benefit gauged in net terms. An easy process to determine the total cost of attending college is to multiply the average annual cost by the amount of years needed to complete the desired degree. The typical annual cost of attending college full time for the 2015-2016 school year in

FIGURE 2

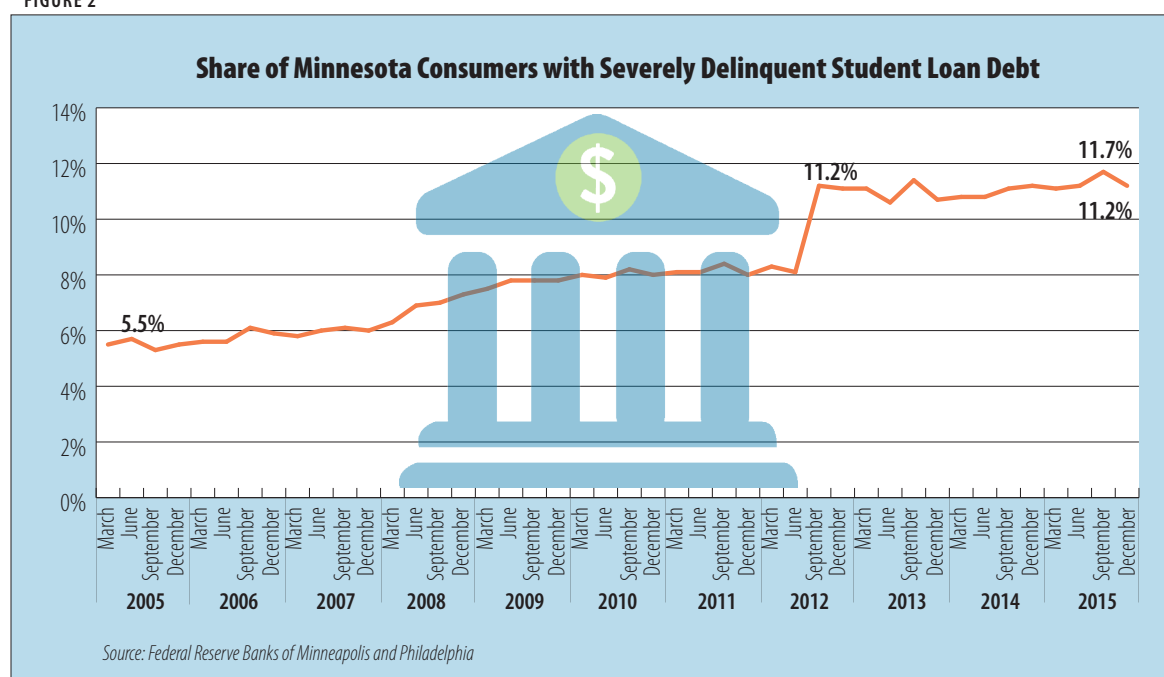
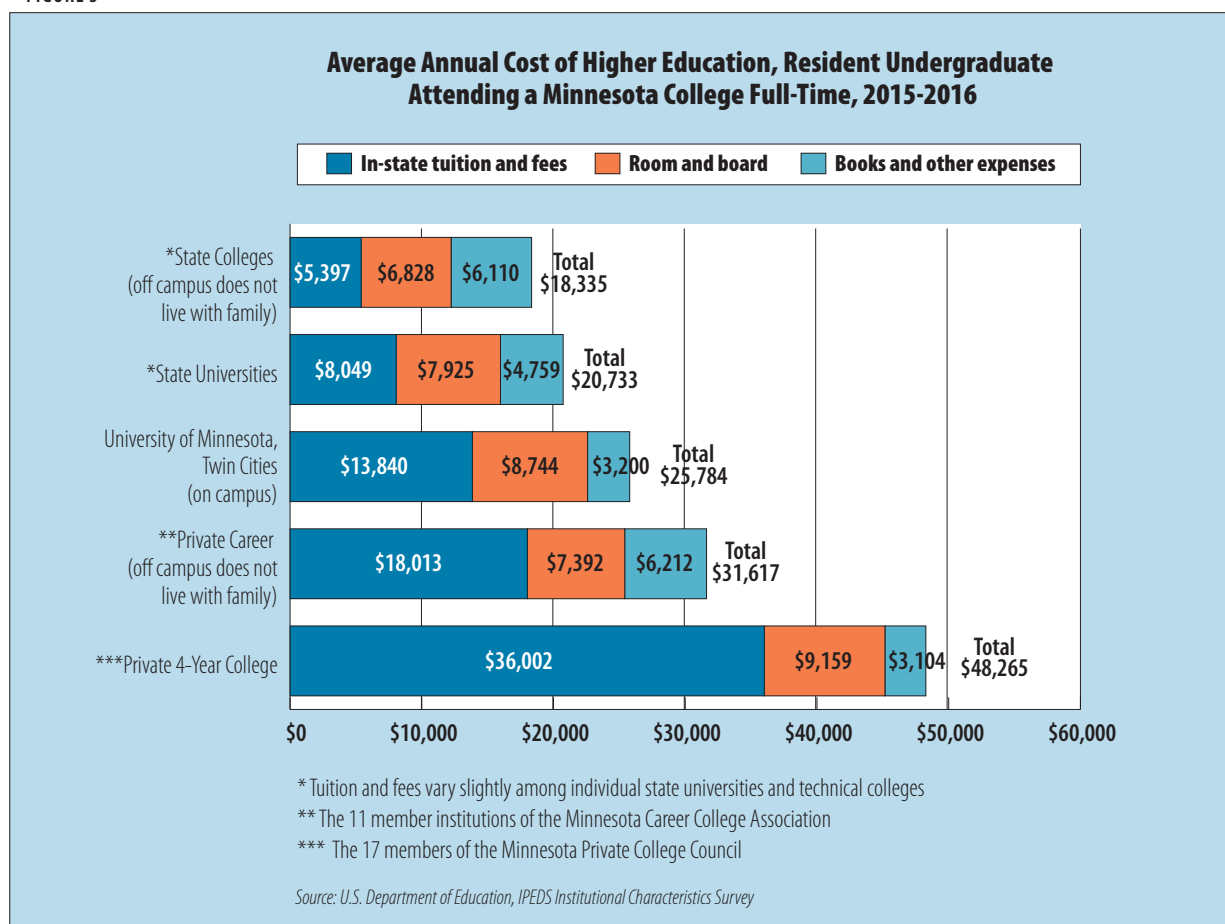


FIGURE 3



Minnesota ranged from \$18,335 at a two-year state college to \$48,265 at private four-year colleges. Using these estimates, a simple calculation of the total cost to attain a four-year degree at a state university would be  $\$20,733 \times 4 \text{ years} = \$82,932$  (see Figure 3).

In 2014, however, only 36.2 percent of full-time, first-time students at public four-year institutions in Minnesota graduated within four years with a bachelor's degree from the same school where they started.

Fifty-five percent graduated within five years and 63 percent within six years.

Extended enrollment becomes even more likely if students aren't sure about what careers and programs to pursue. So a more realistic estimate might be to plan for at least one extra year to complete a bachelor's degree. Some programs (such as engineering) require students to take specific classes within the first few semesters in order to graduate on time. Waiting until the second year to nail down a

specific major could prove costly.

Financial aid also needs to be considered. In the 2013-2014 school year, 49 percent of students attending state universities received some amount of grant aid, with an average amount of \$4,591.

Table 1 illustrates the average net cost of education at various institution types in annual terms and the total net cost of completing on time, as well as taking an extra year to

graduate. The net cost includes tuition and fees, books and supplies, and living expenses, but it also deducts the typical amount received in grants and scholarships.

### Put It on My Tab

Federal student loans are another major part of financial aid. In the 2013-2014 school year, 52 percent of all undergraduates received federal student loans averaging \$6,990. Federal loans do not decrease the cost of higher education and only defer payment.

Although the numbers might look shockingly high, most students graduate with considerably less student loan debt than the total net cost to complete their degree on time. Education also can be funded by working while enrolled or through work-study programs, family funding and 529 plans, among other sources.

Students also can cut the amount of debt they accumulate through less expensive housing, meals and transportation arrangements.

The current total borrowing limit for dependent undergraduate students tops out at \$31,000, roughly the same as the average loan debt in 2014 of \$31,579. Borrowing the full federal loan limit of \$31,000 has a substantial

TABLE 1

Net Cost of Higher Education for First-Time, Full-Time Undergraduates in Minnesota, 2013-2014				
	Institution Type	Average Annual Net Cost	Completing On-Time	Completing In One Extra Year
2-Year	State College	\$14,000	\$28,000	\$42,000
	Private For-Profit 2-Year	\$22,900	\$45,800	\$68,700
4-Year	Public 4-Year	\$17,200	\$68,800	\$86,000
	Private Not-For-Profit 4-Year	\$24,300	\$97,200	\$121,500
	Private For-Profit 4-Year	\$21,400	\$85,600	\$107,000

*Source: Minnesota Office of Higher Education*

impact on the quality of life and discretionary income available for graduates starting their careers.

For example, using an average debt load of \$31,579, interest rates of 6.8 percent and a 20-year term, the total cost of the loan would amount to almost \$58,000 due to the additional \$25,700 paid in interest. Using those terms, a graduate's monthly payment would be \$241.05 over 20 years. More attention and education placed on the real cost of loans could help keep potential borrowers from over-extending their finances for education and other purchases.

### Return on Education

Of course, understanding the cost of education is only one side of the equation. The other side is the return.

DEED's Graduate Employment Outcomes (GEO) tool can help potential students find out how much income graduates with specific majors and award levels earn. The tool enables them to compare the costs of college with the typical earnings of graduates from the programs of study they are considering.

Until recently, post-graduation income was largely a guesstimate, based on wage estimates of established workers. Fortunately, the GEO tool provides potential students with the data necessary to quantify the risk associated with borrowing money to finance higher education.

According to GEO, recent graduates completing a certificate or diploma program could expect to earn almost \$36,000 within 24 months of



graduating if they found full-time, year-round employment. Associate degree completers earned a median wage of \$38,385 within 24 months of graduation, while bachelor's degree earners could expect over \$41,000 by their second year working (see Figure 4).

Since the data in Figure 4 represent the median, however, students and their parents should keep in mind that half of the graduates make more than the published wages and the other half make less. Although knowing the median income earned at each award level is beneficial, finding the details for a specific program is much more useful when guiding financial decisions.

## Strategic Education Planning

As illustrated in Figure 5, earnings for bachelor's degree holders range from a median of \$32,000 a year for those who majored in parks, recreation and leisure studies to nearly \$66,000 for those with chemical engineering degrees.

It should be noted that the share of parks, recreation and leisure studies graduates working full-time and reporting wages in every quarter throughout the year is substantially lower than all other bachelor's degree programs combined. On the other hand, the ratio of chemical engineering graduates who are employed full-time and year-round is significantly higher than typical. This pattern holds true

for at least the second, third and fourth years after graduating.

Students deciding between different degree levels, programs or institutions would be wise to recognize that increasing the length of time attending higher education does not always correlate to increased income after graduation. Graduates from the highest-earning programs of study within each award level (certificate, associate or bachelor's degree) have similar wages and wage growth.

Figure 5 demonstrates how deciding on the type of program to pursue can yield exceptional returns from higher education, while the same investment may not pay off as handsomely in lower-earning programs. Students should also consider the extra years of income earned for shorter programs, as well as the cost to delay career opportunities for longer programs.

## Cost of Living

Enrolling and paying for education is best accomplished with clear direction and goals. As obvious as this may seem, graduate income data can provide guidance on whether it makes sense to borrow for education. Graduates from programs with higher median income after completion should be able to afford higher loan payments.

FIGURE 4

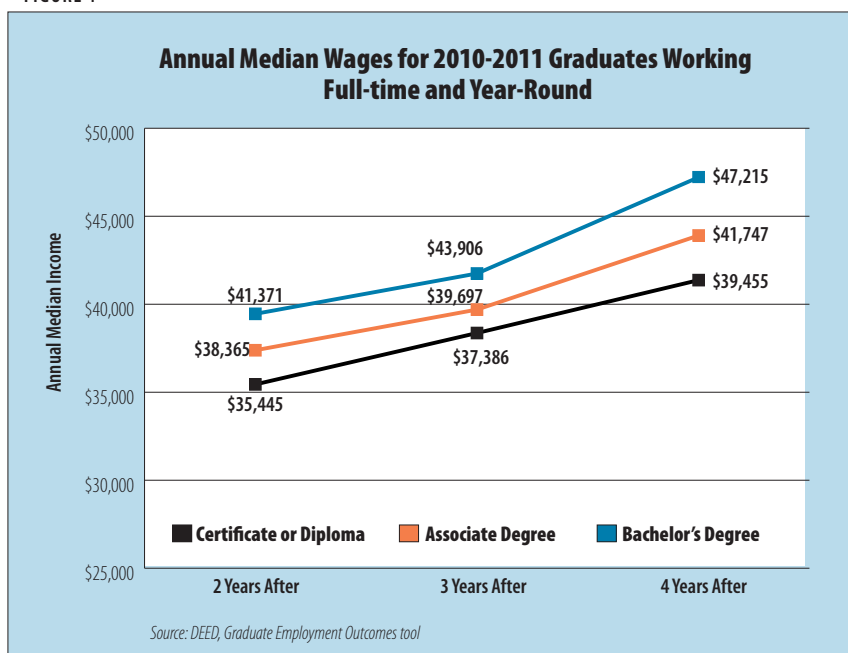
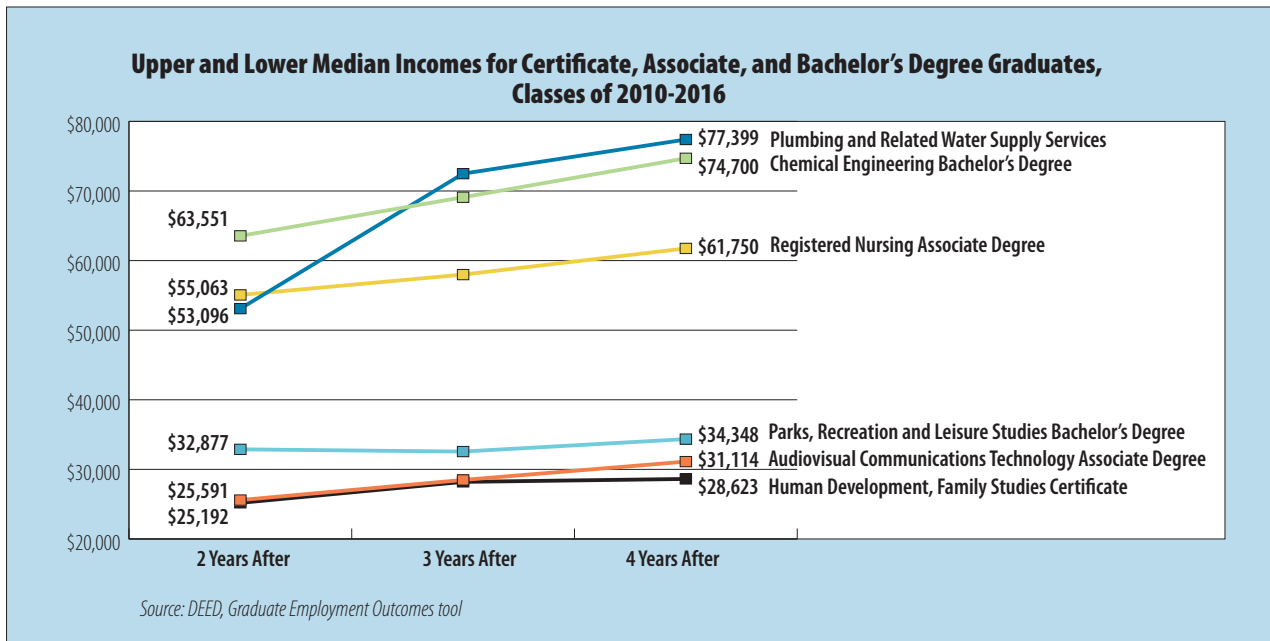




FIGURE 5



Equally important to financial stability is the expected cost of living. The basic cost to live in Minnesota for a single worker with no children is \$30,084, according to DEED's Cost Of Living tool. Potential students can use the cost of living estimates at their current or expected family composition (including a spouse and children), then add the typical or expected monthly student loan payments to help plan funding for higher education and possibly prevent over-borrowing.

The example in Figure 6 uses the median income earned 24

months after graduating for bachelor's degree graduates from the class of 2013 who were employed full-time and year-round. It subtracts the basic cost to live in Minnesota for a single worker with no children and subtracts the estimated monthly student loan payment using the average student loan amount in Minnesota. The remaining disposable income represents an amount beyond the basic needs cost for a single person in Minnesota.

Individualized data should be substituted where possible, including changing the cost

of living for different family compositions and the anticipated income earned by graduates from specific programs and colleges using the Graduate Employment Outcomes tool.

### Expanding Horizons

Higher education remains an excellent vehicle to expand employment horizons. The financial costs and benefits vary, however, depending on individual choices. The cost greatly depends on the type of institution attended, length of enrollment, financial aid and how much money is borrowed.

FIGURE 6

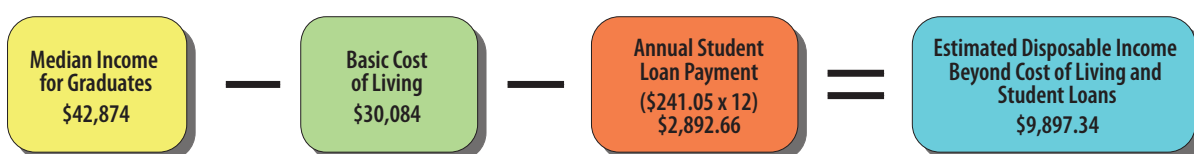




PHOTO: BRETT GROEHNER

The benefits depend on the program of study pursued, the rigor of job search after graduation and, overall, the ability to find a job that will reward the education attained. The best return on education will come by increasing income or decreasing the cost.

### Increasing Education's Return

Some ways to increase the return on education include the following:

- Explore and understand the desired occupation before enrolling in the associated program. Doing this should promote on-time graduation and decrease the cost of changing programs and

possibly extending the amount of time enrolled in school.

- Work while in school. This is an excellent way to decrease the cost of student loans. The work experience and skills gained while enrolled can also provide better employment options after graduating. This is especially beneficial if employment can be found within the field of study.
- Look for companies that offer tuition reimbursement and other similar programs that pay for higher education for employees. This is an excellent option for families to “earn while you learn” and maintain a stable income source.
- Apply for scholarships and grants. They directly decrease the cost of higher education and don't need to be repaid. It's probably the closest thing to a free lunch.
- Be thrifty. The typical costs of pursuing higher education can be reduced by making conservative financial

decisions (living at home, packing lunches, renting or selling back textbooks).

- Make sure the program leads to a credential that employers value. Consider the income earned by graduates who have completed the program of interest in previous years and look at the availability of full-time, year-round jobs of graduates from that program. With abundant education options to choose from in Minnesota, there is a good chance to align interest with income.

Education is freeing in many ways, and knowledge is power. Students, however, should plan carefully so that they don't end up financially powerless. Knowledge gained through higher education should promote financial success, and learning “how to think” helps students make better life decisions.

Yet, over-borrowing to acquire that knowledge can take away financial freedom and leave students feeling powerless over their financial future. Therefore, balancing the costs of education with the benefits is a worthwhile exercise. **T**

Source:

*U.S. Department of Education, IPEDS Student Financial Aid Survey*  
*Average Student Debt: The Institute for College Access and Success (TICAS),*  
<http://ticas.org/posd/map-state-data-2015#>

# The Evolution of Minnesota's Knowledge-Based Service Economy

*Various forces are driving job growth in some Minnesota occupations and decline in others.*

Minnesota's ongoing shift from a goods-based to a knowledge-based service economy is evident in the occupational and industrial employment shifts that have occurred over the last decade and in the changes projected for the next decade (Figure 1 and 2).

Even though net job growth was only 111,000 between 2004 and 2014 and is projected to be only 130,000 from 2014 to 2024, plenty of changes are occurring below the surface when it comes to occupational and industrial employment in Minnesota.

Shifts in consumer tastes, evolving technology, innovations in business and management practices, changes in government funding, globalization and changes in laws are the leading forces, among many, causing declining employment in some occupations that once offered solid careers. Those same forces are creating rapid growth in other occupations that were unheard of just a decade ago.

Occupations that are heavily concentrated in shrinking industries have and will continue to see job numbers fall. Production jobs, such as print binding and finishing workers or paper goods machine setters, are declining occupations in shrinking industries.

Health-care related occupations, like registered nurses or medical assistants, on the other hand, have been and will continue to be expanding occupations.

Shifts in the occupational staffing pattern in industries with declining or flat employment can still generate job growth for some occupations. Paralegals and legal assistant jobs increased in the state over the last decade even though employment in the legal industry declined. During that period, legal firms hired paralegals to perform tasks previously carried out by lawyers.

Surveyor and surveying technician positions are examples of occupations that are being negatively affected by advancing

technology. Advancement in surveying technology, such as robotic total stations, have increased productivity, thereby reducing demand for surveyors even as the amount of surveying work expands.

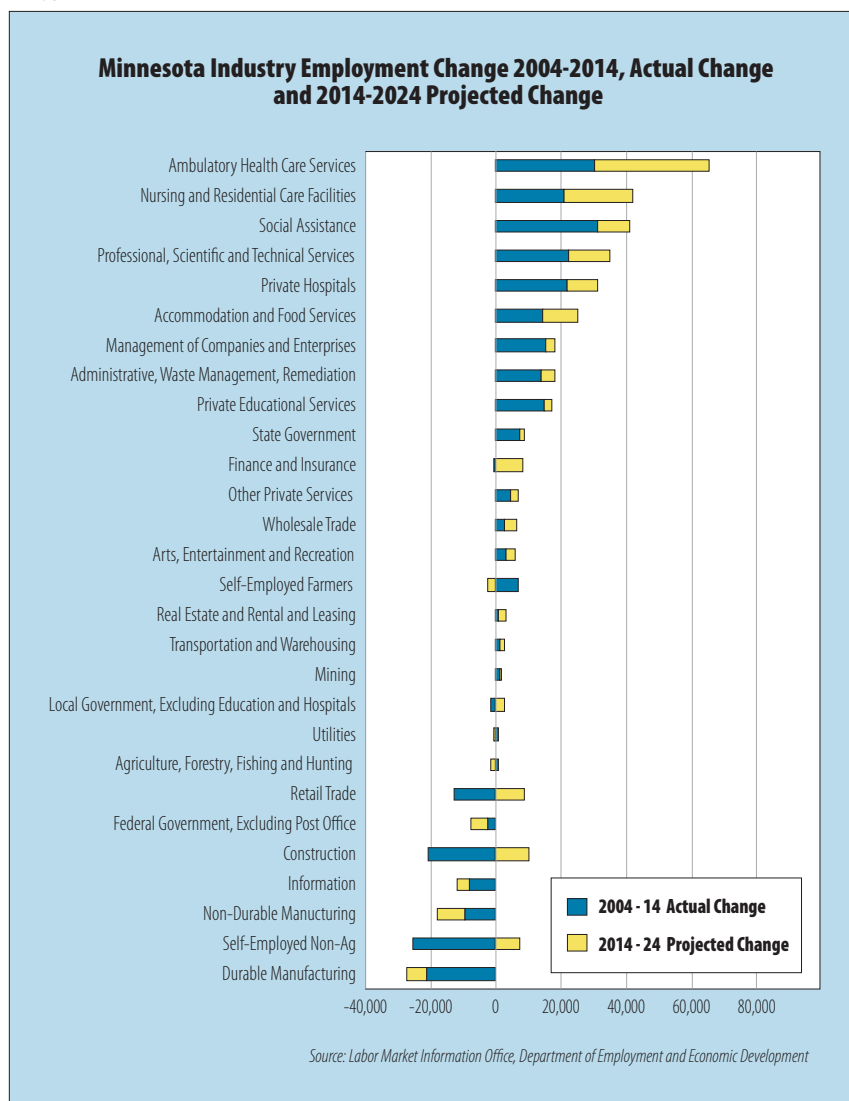
The jump in cooks and bartenders in the state over the last 10 years is the result of Minnesotans increasingly preferring to dine out rather than cook at home. That trend is expected to continue.

Changing consumer preferences drive the fortunes of many industries while reshaping the state's workforce.

The forces shaping Minnesota's industrial and occupational mixes are both short-term (cyclical) and long-term (structural). The number of construction occupations declined for five years in a row starting in 2006 as the housing boom collapsed. Construction jobs have been gradually recovering since 2010 and are expected to continue to increase as part of the cyclical



FIGURE 1



recovery from the industry's most infamous boom-and-bust building cycle ever.

Manufacturing employment in Minnesota and the U.S. has been bouncing back since the Great Recession, but the rebound is only short-term, as the long-term or structural trend is shrinking factory employment.

U.S. manufacturing employment

in 2015 was 7 million jobs below peak factory employment in 1979, a decline of 37 percent. In Minnesota, manufacturing employment is down 20 percent (a decline of 79,000 jobs) from the 1998 peak.

Increased automation on the floors of U.S. manufacturing plants rather than offshoring of manufacturing jobs is responsible for the majority

of manufacturing job losses. Adjustments to trade deals and increasing costs in low-cost manufacturing countries may eventually lure some manufacturing positions back to U.S. shores. But productivity gains from automation will continue the long-term trend of a shrinking manufacturing workforce nationally as well as in Minnesota.

Increasing automation in manufacturing is a prime example of how structural change will continue to shape the state's workforce. The continuing adoption of software across most industries increases productivity but reduces demand for a wide variety of occupations.

Other occupations, however, such as computer-related jobs, benefit as software advances. Expanding emphasis on cloud computing, collection and storage of big data, and demand for mobile computing insures continuation of the long-term trend of computer-related jobs expanding, even as some computer jobs are outsourced to low-wage countries.

Figures 1 and 2 show employment changes across occupations and industries during the previous 10 years and projected changes across occupations and industries over the next 10 years. Minnesota's goods-producing sector, which includes agriculture, mining,

construction and manufacturing industries, accounted for the majority of job loss over the last decade. Declining employment in those industries leads to falling construction and production occupation jobs.

The retail trade industry also saw declining employment, resulting in declining jobs in sales and related occupations. The drop in office and administrative support occupations, such as data entry keyers, order clerks and stock clerks, didn't arise from job cuts in any particular industry but rather from an economy-wide adoption of technology that reduced the demand for workers.

Production and office administrative support occupations are expected to continue to decline in the future as automation improves productivity and thereby decreases the need for workers in these occupations.

The forces that drove employment growth in service-providing industries from 2004 to 2014 will continue to generate most job growth from 2014 to 2024. The end result, just like over the last decade, will be lots of job growth in health care occupations. Most of the other job growth will also occur in service-related industries and occupations as Minnesota continues to evolve into a knowledge-based service economy. **T**

FIGURE 2

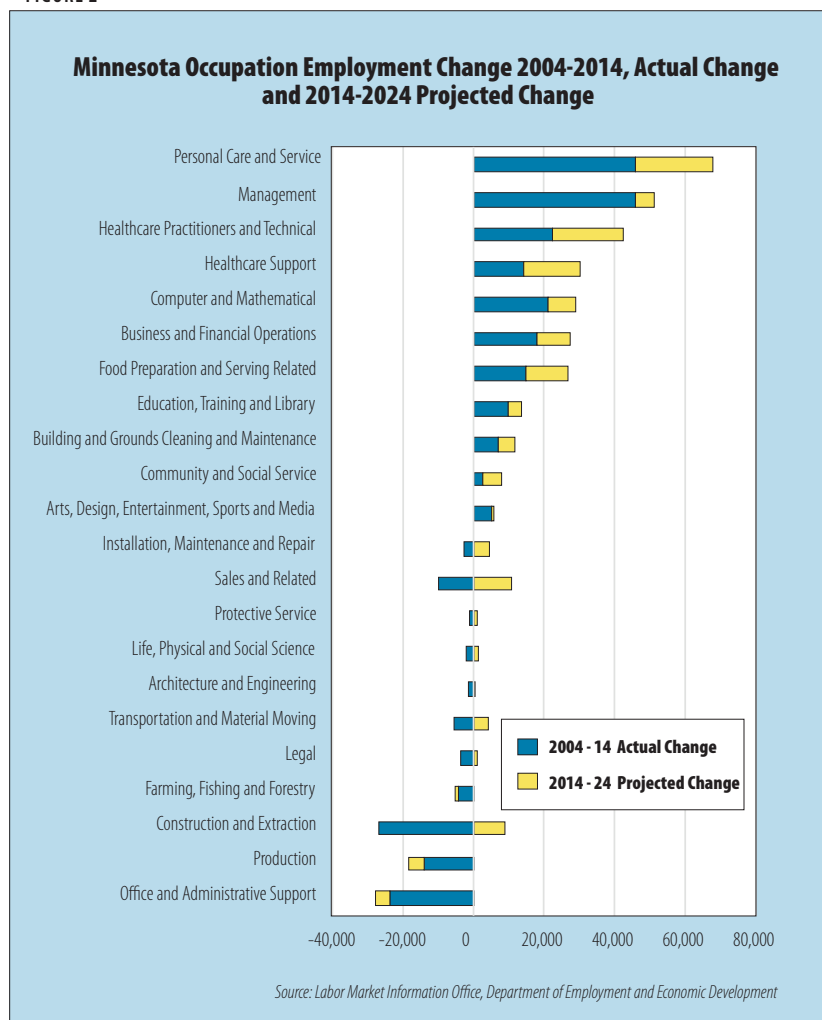


PHOTO: LISA F. YOUNG

# A Workforce in Transition

*The increasing number of older workers is one of the most significant changes in the Minnesota labor force.*



As David Bowie once warned in “Changes,” pretty soon we’re all going to get a little older. As the workforce ages, many employers are already straining to find new workers. The increasing number of older workers is one of the most significant changes occurring in Minnesota’s economy, affecting every industry in every region of the state.

Twenty percent of jobs in Minnesota are now held by workers ages 55 and over, up

from 13.5 percent of jobs just one decade earlier. And the next decade will likely bring even more change, with another 20 percent of jobs currently held by 45 to 54 year olds (see Table 1).

In contrast, the number of jobs held by workers in the youngest age groups was falling fast. Teenagers dropped out of the labor force in large numbers over the past decade, and for a variety of reasons.

A large number of teenagers and young adults are focusing more on their educations, while others are busier with activities than in the past. Many struggled to compete with more experienced workers for the limited job openings during the recession.

However, with the labor market tightening in recent years and older workers starting to retire, teenagers are re-entering the workforce in greater numbers and snatching up entry-level jobs in industries like accommodation and food services, retail trade, health care and social assistance, and arts, entertainment and recreation.

## Quarterly Employment Demographics

DEED’s new Quarterly Employment Demographics (QED) program makes it easier to document the dynamics behind the aging of Minnesota’s workforce. Collected through a data exchange between DEED and the Minnesota Department of Public Safety, the QED data combine wage records from Minnesota’s Unemployment Insurance Program with demographic data on gender and date of birth from driver’s license records.

Though drawn from the same wage records as DEED’s Quarterly Census of Employment and Wages (QCEW) program, directly comparing the two datasets is problematic. Whereas QCEW is an average of the employment count during each month, wage records in QED are not limited to the reference week and treat individual Social Security numbers separately, causing QED to produce higher employment counts than QCEW. Therefore, QED may be



easier to understand as a share of total employment rather than a count of jobs.

In addition, employment data only can be linked for workers who have driver's licenses, though the QED dataset has consistently shown a better than 90 percent match rate with wage records. By assigning demographic data to wage records, the QED dataset provides new insights that weren't previously available, including median hourly wages by gender and age group, broken down at the state, regional and county level.

## Go West, Old Man

From a workforce standpoint, the two oldest regions in the state were Southwest and Northwest, which both had over 22 percent of jobs held by workers ages 55 and over. On the other side of the state, over 21 percent of the workforce in both Northeast and Southeast were in the oldest age groups.

The Twin Cities, home to 60 percent of the jobs in the state, was the youngest region, with just 18.5 percent of job holders in the oldest age groups. Likewise, less than 20 percent of jobholders in Central Minnesota were 55 and older in 2015 (see Map 1).

TABLE 1

	Percent of Jobs in 2005	Percent of Jobs in 2015	Change in Jobs, 2005-2015
<b>TOTAL JOBS</b>	<b>100.0%</b>	<b>100.0%</b>	<b>+5.5%</b>
19 years and younger	8.6%	6.9%	-15.6%
20 to 24 years	12.5%	11.2%	-5.3%
25 to 44 years	43.8%	42.1%	+1.6%
45 to 54 years	21.6%	20.2%	-1.0%
55 to 64 years	10.8%	15.5%	+51.7%
65 years and older	2.7%	4.0%	+54.5%

*Source: DEED, Quarterly Employment Demographics (QED)*

MAP 1

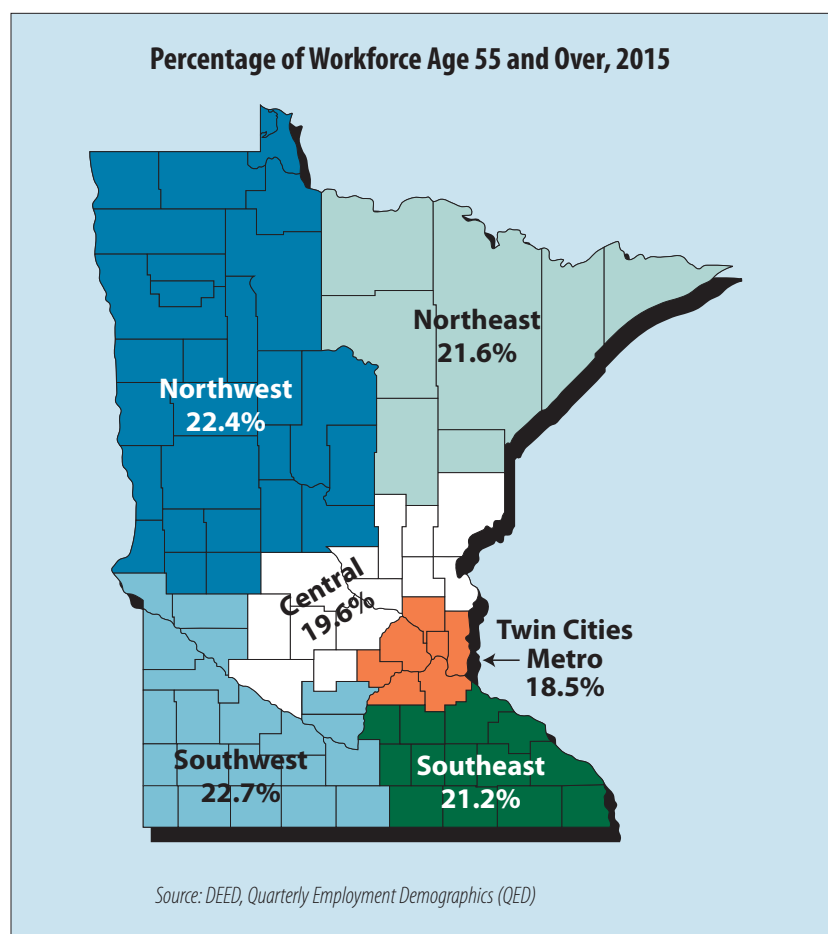
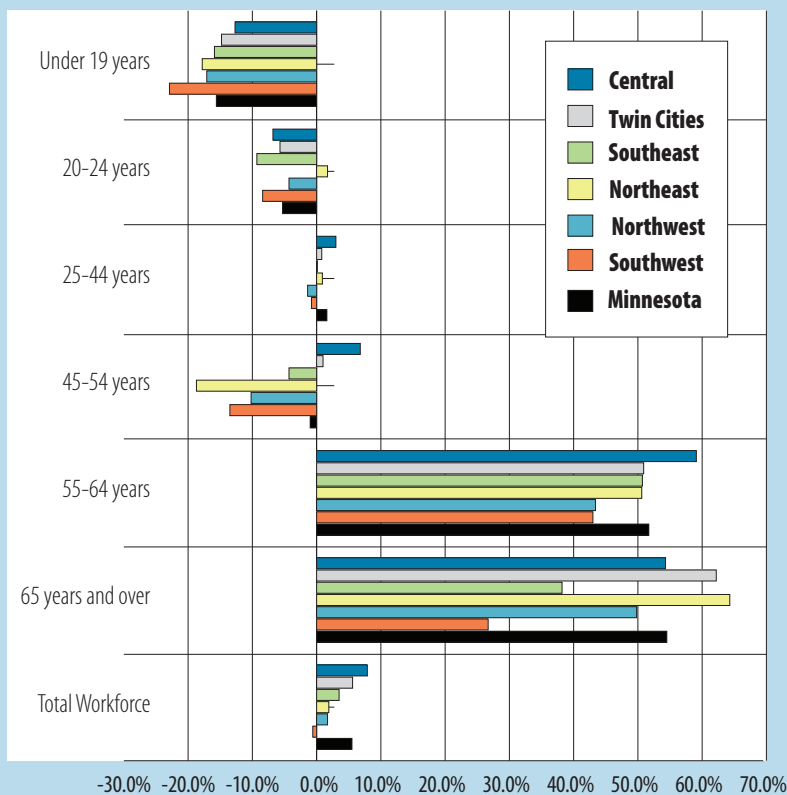


FIGURE 1

### Percentage Change in Workforce by Age Group by Region, 2005-2015



Source: DEED, Quarterly Employment Demographics (QED)

Every region saw huge increases in the number of older workers over the past decade, a shift made more significant by huge declines in the number of jobs held by younger workers (see Figure 1).

### Southwest Minnesota

Teenagers and entry-level workers suffered the brunt of the job cutbacks in Southwest Minnesota over the past decade, but the region still had the third-highest percentage of jobs held by younger workers in 2015.

As noted, the 23-county planning region has the strongest dependence on older workers in the state, but ironically saw the slowest increase in the number of jobs held by the oldest workers between 2005 and 2015 (see Table 2).

Southwest Minnesota is unique as the only region where manufacturing is still the largest employing industry, with just under 32,000 jobs. From 2005 to 2015, the region's manufacturers cut 3,600 jobs, a 10 percent decline. Six of the 14 manufacturing subsectors in Southwest Minnesota, however, added jobs over the past decade, while the other eight lost jobs.

The growing subsectors – which included nonmetallic mineral product, fabricated metal product, chemical,

TABLE 2

Southwest Minnesota			
Employment Demographics	Percent of Jobs in 2005	Percent of Jobs in 2015	Change in Jobs, 2005-2015
19 years and younger	11.1%	8.6%	-22.9%
20 to 24 years	13.0%	12.0%	-8.4%
25 to 44 years	38.1%	38.0%	-0.8%
45 to 54 years	21.6%	18.8%	-13.5%
55 to 64 years	11.9%	17.2%	+43.0%
65 years and older	4.3%	5.5%	+26.7%

Source: DEED, Quarterly Employment Demographics (QED)

machinery and miscellaneous manufacturing – tended to be smaller, accounting for less than one-third of total manufacturing employment. The declining subsectors were much larger, including food manufacturing, printing, and computer and electronic product manufacturing. It is important to note that the latter two subsectors accounted for 80 percent of the region's job losses from 2005 to 2015.

The growing subsectors gained both younger and older workers over the past decade, while the declining subsectors cut younger workers and added older workers – or more likely just held onto workers who moved into the older age groups through the natural aging process. Just 2.9 percent of jobs in manufacturing in the region are held by workers ages 65 and over, which will lead to more changes in the next decade (see Figure 2).

### Northwest Minnesota

Northwest Minnesota also relied on a relatively old workforce, with more than 22 percent of the workforce ages 55 and over, and 5.4 percent past the traditional age of retirement. Like Southwest, Northwest's workforce has been trending older for much longer, actually seeing a slower increase in the number of older workers than the rest of the state (see Table 3).

FIGURE 2

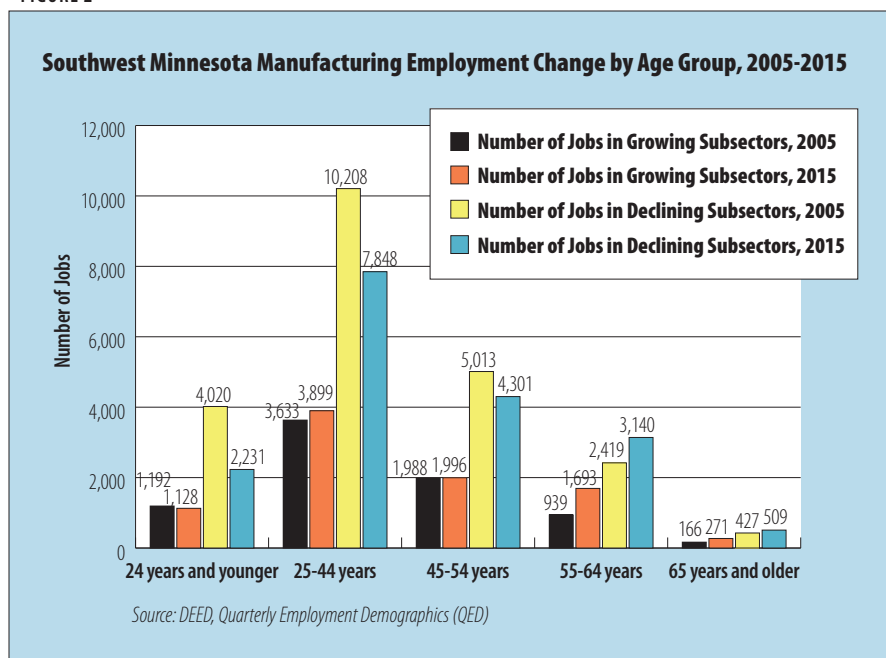


TABLE 3

Northwest Minnesota			
Employment Demographics	Percent of Jobs in 2005	Percent of Jobs in 2015	Change in Jobs, 2005-2015
19 years and younger	11.7%	9.5%	-17.1%
20 to 24 years	12.3%	11.5%	-4.3%
25 to 44 years	38.4%	37.2%	-1.4%
45 to 54 years	21.9%	19.3%	-10.2%
55 to 64 years	12.0%	17.0%	+43.4%
65 years and older	3.7%	5.4%	+49.8%

Source: DEED, Quarterly Employment Demographics (QED)

Still, every industry in Northwest Minnesota saw an increase in the number of jobs held by workers ages 55 and older over the past decade. Just six industries added younger workers from 2005 to 2015, with the biggest gains occurring in educational services, health care and social assistance,

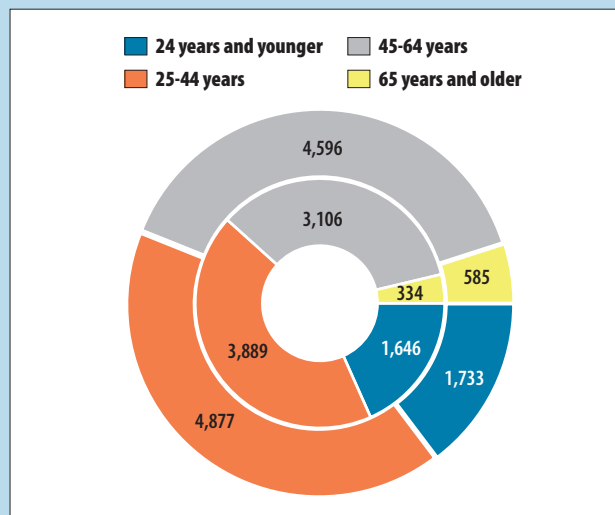
and administrative support and waste management services, which includes temporary staffing services.

In contrast, young workers in the region were swiftly and substantially displaced from the accommodation and



FIGURE 3

### Northwest Minnesota Wholesale Trade Employment Demographics, 2005-2015



Source: DEED, Quarterly Employment Demographics (QED)

### Northeast Minnesota

Surprisingly, Northeast Minnesota has the second-smallest percentage of workers in both the youngest and oldest age groups, behind only the Twin Cities. The dearth of employment at both ends of the age spectrum was not due to a lack of opportunities. It was primarily because of the region's low labor force participation rates, especially for older workers. While low, they were rising over time, as Northeast Minnesota saw the fastest regional increase in the number of jobs held by workers ages 65 and over (see Table 4).

TABLE 4

### Northeast Minnesota

Employment Demographics	Percent of Jobs in 2005	Percent of Jobs in 2015	Change in Jobs, 2005-2015
19 years and younger	9.5%	7.6%	-17.8%
20 to 24 years	12.8%	12.7%	+1.7%
25 to 44 years	38.8%	38.4%	+0.9%
45 to 54 years	24.6%	19.6%	-18.7%
55 to 64 years	11.8%	17.5%	+50.6%
65 years and older	2.5%	4.0%	+64.3%

Source: DEED, Quarterly Employment Demographics (QED)

food services and retail trade industries, which traditionally employ the youngest workers.

Interestingly, the region's distinguishing wholesale trade industry saw rapid employment growth over the past decade, adding over 2,800 jobs, a 30

percent increase. The job gains were spread across every age group, with even young workers seeing an increase in hiring. In fact, nearly 40 percent of the new jobs were gained by workers who were younger than 45 (see Figure 3).

Despite increasing their employment over the past decade, people 65 and older still held less than 2 percent of the jobs in one-third of the industries in the region – including mining, utilities, construction, manufacturing, management of companies, and accommodation and food services. Instead, older workers were most likely to be found working in health care and social assistance, retail trade, educational services and public administration.

In contrast, just three industries in Northeast Minnesota saw an increase in jobs held by teenagers: utilities, health care and social assistance, and educational services, where the

number of teen workers nearly tripled from 2005 to 2015. More than two-thirds of the region's teenagers work in just four industries: accommodation and food services, health care and social assistance, retail trade and educational services.

## Southeast Minnesota

Aided by the region's status as a medical destination, Southeast Minnesota has enjoyed healthy employment growth over the past decade. Every industry experienced a shift toward an older workforce, but they were all overshadowed by the outsized influence of the region's health care and social assistance sector, which accounted for more than one-third of the jobs gained by workers ages 55 and over.

The four subsectors in health care and social assistance are a study in contrasts, clearly influenced by the educational and physical requirements of the jobs in each specialty. Led by health care practitioners like doctors and nurses, ambulatory health care services and hospitals both rely much more heavily on middle-aged workers – with nearly 50 percent of jobs held by 25 to 44 year olds. But they also have shown a growing reliance on older workers, with more than 40 percent of jobs held by workers between the ages of 45 and 64.

On the other hand, nursing and residential care facilities depend on a steady flow of younger workers, with nearly a quarter of the total workforce under 25 years of age. Youngsters often take these jobs while pursuing further postsecondary

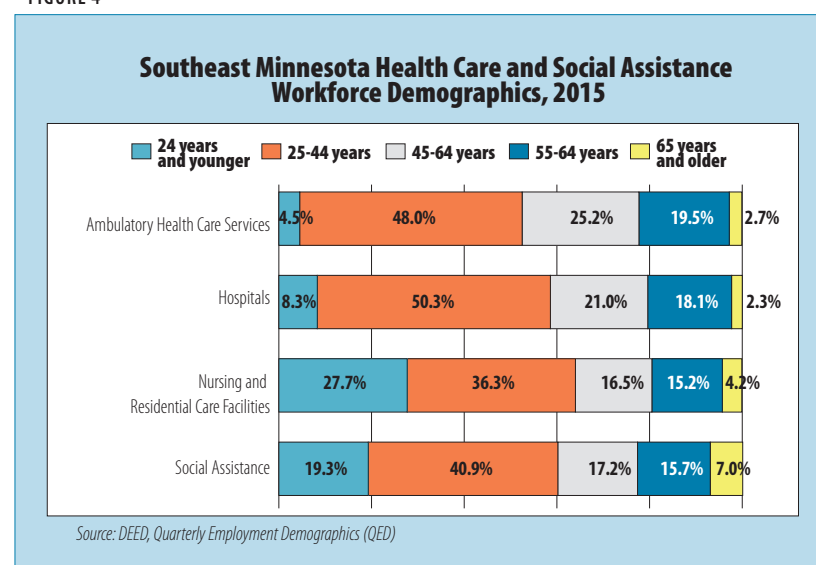
education, and then move on to hospitals and clinics. This is shown by the smaller percentages of workers from ages 25 to 44. To fill open jobs, these subsectors have increased hiring in the oldest age groups in recent years (see Figure 4).

TABLE 5

Southeast Minnesota			
Employment Demographics	Percent of Jobs in 2005	Percent of Jobs in 2015	Change in Jobs, 2005-2015
19 years and younger	9.8%	7.9%	-15.9%
20 to 24 years	12.3%	10.8%	-9.3%
25 to 44 years	41.1%	39.8%	+0.1%
45 to 54 years	21.9%	20.2%	-4.3%
55 to 64 years	11.4%	16.7%	+50.7%
65 years and older	3.4%	4.6%	+38.2%

Source: DEED, Quarterly Employment Demographics (QED)

FIGURE 4



## Central Minnesota

This region boasts the youngest and fastest-growing workforce in the state. The dynamics behind the demographic shifts in this region are unique. Central Minnesota is the only region where more jobs are still held by workers under the age of 25 than

by workers 55 and older.

Central Minnesota, however, also experienced the fastest increase of any region in the number of jobs held by workers over 55 from 2005 to 2015, jumping from 13.3 percent to 19.6 percent (see Table 6).

The region's construction industry suffered severe jobs cuts during the recession, losing just over one-quarter of total employment between 2005 and 2010. Since then, Central Minnesota has seen a strong recovery and was nearly back to 2005 levels in 2015. But while the jobs have returned, the age of the workers holding them has changed.

Workers under 25 years of age held 27.7 percent of total jobs in 2005, but they now hold just 19 percent (see Figure 5). This shift was even more significant in the construction of buildings and specialty trade contractors subsectors, which both dropped from more than 30 percent to 20 percent. It was much less earth shattering in the heavy and civil engineering construction subsector, where only about 15 percent of workers were in the youngest age groups in either time period.

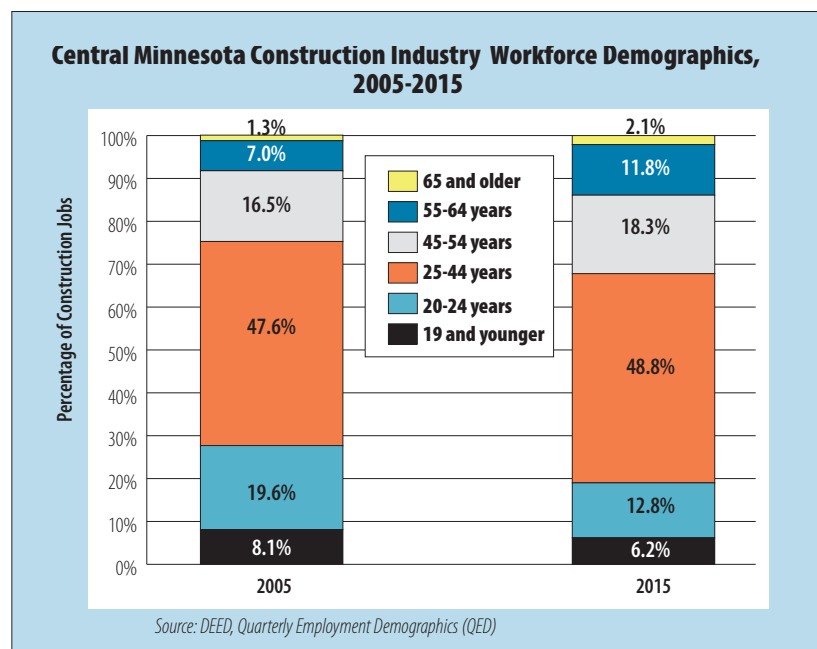
Interestingly, the percentage of construction workers between 25 and 44 years of age held mostly steady, rising just 1.2 percent from 2005 to 2015. Instead, the share of workers over the age of 45 jumped from 24.7 percent to 32.2 percent, rising from one in every four workers to one in every three. More than 40 percent of workers in heavy and civil engineering construction were 45 years and older.

TABLE 6

Central Minnesota			
Employment Demographics	Percent of Jobs in 2005	Percent of Jobs in 2015	Change in Jobs, 2005-2015
19 years and younger	11.7%	9.5%	-12.7%
20 to 24 years	13.9%	12.0%	-6.8%
25 to 44 years	40.9%	39.1%	+3.0%
45 to 54 years	20.1%	19.9%	+6.8%
55 to 64 years	10.3%	15.2%	+59.1%
65 years and older	3.0%	4.4%	+54.3%

Source: DEED, Quarterly Employment Demographics (QED)

FIGURE 5



## Twin Cities

Already home to well over half of the state's population and labor force, the seven-county Twin Cities metro area also draws in nearly 250,000 workers from surrounding regions. Sixty percent of the state's jobs are located in the Twin Cities, making it a prime location for people to grow their careers.

Speaking of prime, nearly two-thirds (64.6 percent) of the region's total jobs were held by workers from ages 25 to 54, often considered the prime working years. That is easily the largest share in the state, nearly 5 percent above the next closest region and 8 percent above the lowest region (see Table 7).

This is especially notable in three industries that are much more strongly concentrated in the Twin Cities than anywhere else: finance and insurance, professional and scientific services, and management of companies. Nearly three-fourths of workers in these three industries were between the ages of 25 and 54 in 2015, although that was a slight decline since 2005.

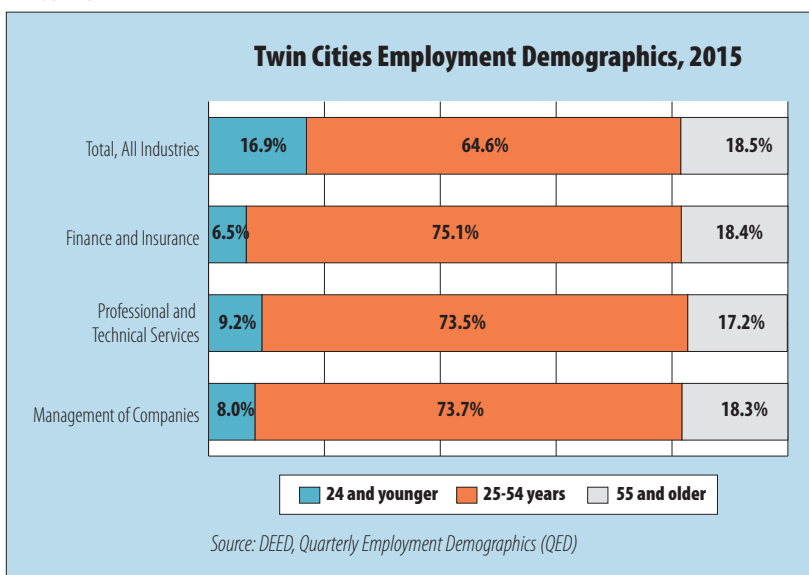
Due to higher educational requirements for many of the careers in these industries, it is harder for younger workers to get established, while the number of

TABLE 7

Twin Cities Metro Area			
Employment Demographics	Percent of Jobs in 2005	Percent of Jobs in 2015	Change in Jobs, 2005-2015
19 years and younger	7.3%	5.9%	-14.8%
20 to 24 years	12.3%	11.0%	-5.7%
25 to 44 years	46.2%	44.1%	+0.8%
45 to 54 years	21.4%	20.5%	+1.0%
55 to 64 years	10.4%	14.9%	+50.9%
65 years and older	2.3%	3.5%	+62.2%

Source: DEED, Quarterly Employment Demographics (QED)

FIGURE 6



older workers is in line with the total of all industries (see Figure 6).

## Time May Change Us

As the demographic profile of Minnesota's workforce continues to change, employers in every

industry and region will be affected. Some sectors have embraced the changes, while others have been slow to adapt. DEED's QED program allows better analysis of the dynamics behind the changes. **T**



# Reviewing the Data, From A to Z

*Each of the nine sources of wage data collected and published by government agencies has its own strengths and limitations.*

**D**EED's Labor Market Information Office is an A to Z source of employment data. In Alexandria, for example, there were 100 accommodation industry jobs on an annual average basis in 2015, according to the Quarterly Census of Employment and Wage (QCEW). That same data showed there were 217 wage and salary jobs across all industries in Zumbro Falls. Statewide, 500 actuaries and 680 zoologists and wildlife biologists were employed, according to the Occupational Employment Statistics (OES) program.

These same sources also report on wages and earnings in various forms. The average annual wage of an Alexandria accommodation industry worker was \$13,183 last year, while average annual wages received by a worker in Zumbro Falls was \$25,147. Minnesota auditors earned an average of \$101,621 in 2015, which easily tops the \$58,517 average annual paycheck paid to zoologists and wildlife biologists.

Three of the four federal/state cooperative programs that collect and report on Minnesota job numbers – QCEW, OES and Current Employment Statistics (CES) – also provide wage and earnings numbers. Wage numbers are valuable for people exploring careers, looking for ammunition when negotiating pay raises, or planning to move and comparing wages paid across localities.

Wage income data are also critical in gauging the speed and direction of Minnesota's economy, since wage income is the single most important source of income for most Minnesota households. Wage data are also the key to analyzing a wide range of labor market issues, including quality of job growth, minimum wages, wage and salary levels by education attainment, wage discrimination and income inequality.

Identifying a worker shortage for a specific occupation is another common use of wage data, as occupations in high demand

usually experience higher-than-average wage growth. Another common use of wage data is comparisons of wages across regions and over time to gain insights into the relative economic health of regions.

There are reams of wage data available on the internet (especially if sites such as Salary.com and Payscale.com are considered). Finding the data that you want can be daunting. This article reviews nine sources of government wage data that are available for free on the internet. None of the sources reviewed provides everything, as each has its own strengths and limitations.

Figures 1-3 highlight the major differences between the nine sources. Differences include how the data are collected, median versus average (mean) wage, where the data are collected from, frequency of data collection and publication, and the level of geographic, industrial and occupational detail published.

The following is a brief discussion of the nine sources of wage data.

### Current Employment Statistics (CES)

CES reports average hourly and weekly earnings for the state and Minnesota's five metropolitan statistical areas each month (see Figure 1). Hourly wage estimates are available at the national level for over 600 private-sector industries, but the level of industry detail is limited for Minnesota since the monthly survey of employers is small.

Earnings estimates are only for all private employees for the four smaller MSAs and at the sector level for the Minneapolis-St. Paul MSA and the state. Hourly and weekly earnings estimates (along with average weekly hours) are timely economic indicators for gauging the direction of the economy but should be used with caution for the smaller metro areas.

CES earnings data are used by the Bureau of Economic Analysis in its initial estimates of state quarterly income.

Government and agricultural wages are excluded, and most of the Minnesota data start in 2007.

CES wage data show Minnesota's private-sector average hourly wage increased



11.3 percent between 2009 and 2015 before accounting for inflation. The U.S. private-sector average hourly wage increased slightly faster over the same period, rising 12.9 percent. Private hourly pay was still 4.1 percent higher in Minnesota (\$26.06) than nationwide (\$25.03) last year.

### Quarterly Census of Employment and Wages (QCEW)

QCEW wages are compiled from quarterly unemployment insurance reports that almost all Minnesota employers are required to file (see Figure 1). Wages by place of work and industry for over 2.6 million jobs are in the QCEW records. The six-month time lag in

publication is the big drawback of QCEW wage data and other wage sources based on QCEW records. QCEW wage data are reported as average weekly wages derived by simply dividing total quarterly wages by 13, the number of weeks in a quarter.

QCEW offers wage data with a high degree of geographic and industrial detail. The detailed wage data are valuable for comparing industries or regions.

QCEW industry average wages are often noticeably different from CES average wage estimates, as QCEW earnings count all types of paid compensation, including bonuses and exercised stock options. CES counts only base pay.

FIGURE 1

	Current Employment Statistics (CES)	Quarterly Census of Employment and Wages (QCEW)	Occupational Employment Statistics (OES)
<b>Description</b>	Average hourly wage and weekly earnings for all private employees and private production workers	Quarterly and annual total wages and average weekly wages	Average and 25, 50, 75, and 90 percentiles hourly and annual wages
<b>Industry or Occupation</b>	Industries (mostly two digit NAICS)	Industries (all NAICS levels)	800 occupations (two-digit and six-digit SOC)
<b>Methodology</b>	Monthly survey of 2,400 employers	Census of all employers and jobs covered by unemployment insurance (97 percent of total wage and salary employment)	Semiannual survey of 2,700 employers per survey with three years' worth of data used to produce wage estimates
<b>Populations Excluded</b>	Self-employed, agricultural workers, domestic workers	Self-employed, railroad workers, student workers, elected officials, and most religious organization workers	Self-employed, some agricultural workers, domestic workers, military
<b>Currency</b>	Monthly data available by the third week of the following month	Quarterly data available six months after the end of the quarter	Annual estimates available with 10-month lag, wage estimates adjusted quarterly to account for wage inflation using the BLS Employment Cost Index
<b>Historical Availability</b>	2007 (selected industries back to 2001)	2000 (earlier years available at BLS website)	1997 (only current wage data is available at MN DEED's site, earlier data is available at BLS website)
<b>Geographic Detail</b>	U.S., states, MSAs	U.S., states, MSAs, sub-state regions, counties, cities	U.S., states, MSAs, sub-state regions
<b>Advantages</b>	Current wage data, time series analysis	Complete universe of employers, fine level of geographic and industry detail, wage data by firm size	Occupational employment, wage distribution, and staffing information
<b>Limitations</b>	Not available for small, local areas, revised and benchmarked annually	Six month time lag and some data confidentiality limits	Not a time series, limitations on reporting to small regions
<b>Links</b>	<a href="http://mn.gov/deed/ces">mn.gov/deed/ces</a>	<a href="http://mn.gov/deed/qcew">mn.gov/deed/qcew</a>	<a href="http://mn.gov/deed/oes">mn.gov/deed/oes</a>

QCEW wage data show that Minnesota's average annual wage in 2015 in the private sector was \$53,960, compared with \$52,870 for the U.S. Minnesota's private average annual wage was 2.1 percent higher than the national average last year, according to QCEW.

### Occupational Employment Statistics (OES)

If you are interested in the wages of a specific occupation, OES is the source to turn to (see Figure 1). Mean and median wage rates (hourly and annual) along with 10th, 25th, 75th and 90th

percentiles are estimated for over 800 occupations.

The OES data tool is one of the most heavily used on the LMI website. People want to know how their paychecks compare with others or how the pay rate of an occupation varies within the state or across the nation.

OES data can also be used at the aggregated level (aggregated across all occupations) to examine a region's income inequality since the distribution of wages are provided.

OES wage estimates are obtained by surveying employers. Employers are asked about job titles, number of workers and wages. The job titles are then coded into detailed occupations. OES survey samples are drawn from non-farm employers who participate in Minnesota's unemployment insurance program. Roughly 6,000 employers provide wage numbers in the survey each year.

The survey, however, is not designed to produce wage estimates that are comparable from year to year. Since OES provides the only historical series

of detailed occupational wages, the limitation is often ignored. The highest median annual pay (median pay isn't available for all occupations) in Minnesota is earned by family and general practitioners (\$181,400). Half of family and general practitioners make more than that and half make less. That is about 10 times the lowest median annual wage of \$18,600 for fast food cooks.

### Job Vacancy Survey (JVS)

Median hourly wage estimates for job openings in Minnesota are obtained through the Minnesota Job Vacancy Survey, which is conducted twice a year, in the second and fourth quarters. The survey, which has been carried out since 2001, provides median hourly wage estimates for two-, three- and six-digit levels for occupations

and the two-digit industry level (see Figure 2). For example, during the second quarter of 2015, the median hourly wage offer for civil engineers was \$28.42, while the median hourly wage offer for openings in the manufacturing industry was \$15.58.

Wage estimates are gathered through a sample of approximately 10,000 firms across Minnesota's 13 economic development regions. Analysis of job vacancy wage offers over time provides insight into the quality of jobs (in terms of wages) being created in Minnesota. More recent job vacancy releases have included wage estimates by size of company and 25th and 75th percentiles for wage offers, in addition to median wage offers (50th percentile).





FIGURE 2

	<b>Job Vacancy Survey (JVS)</b>	<b>Quarterly Employment Demographics</b>	<b>Graduate Employment Outcomes (GEO)</b>
<b>Description</b>	Median hourly wage offer	Quarterly and annual median and average hourly wages by gender and age	Median hourly and median annual wages of recent graduates from various post-secondary programs in Minnesota
<b>Industry or Occupation</b>	Industries (2-digit NAICS) and occupations (2-digit and 6-digit SOC)	Industries (two and three digit NAICS levels), gender, and age groups	Classification of Instructional Programs (CIP), school and industry
<b>Methodology</b>	Semiannual survey of 5,000 employers per survey	Unemployment insurance records linked to driver's license data. Roughly 90 percent of individuals in unemployment insurance records have driver's license match.	Annual and quarterly post-secondary graduates wage records are linked to unemployment insurance wage records.
<b>Populations Excluded</b>	Self-employed, railroad workers, student workers, elected officials, and workers of religious organizations	Self-employed, railroad workers, student workers, elected officials, and most religious organization workers	Self-employed, federal government employees, and graduates employed outside of Minnesota
<b>Currency</b>	2nd and 4th quarter data available four months after end of quarter	Quarterly data available six months after the end of the quarter	Most recent data is for graduates during the July 2013 – June 2014, lagged time is roughly six months for wage data
<b>Historical Availability</b>	2001	2000	July 2006 – June 2009 graduates
<b>Geographic Detail</b>	Minnesota, Seven-Country Twin Cities Metro Area, Greater Minnesota, Economic Development Regions, and Planning Regions	Minnesota, sub-state regions, and counties	Minnesota, Twins Cities Area, and Greater Minnesota
<b>Advantages</b>	Part-time versus full-time and education requirement wage data for job vacancies	Median wage data by gender and age across detailed industries and detailed areas	Data provides realistic expectations for employment and wages following graduation in a specific program
<b>Limitations</b>	Not available for detailed local areas	Six month time lag and some data confidentiality limits	Data limited to programs which have a least 10 graduates, wages of self-employed graduates and graduates who obtain jobs outside of state are excluded
<b>Links</b>	<a href="http://mn.gov/deed/jvs">mn.gov/deed/jvs</a>	Not yet available – check <a href="https://mn.gov/deed/data/">https://mn.gov/deed/data/</a> after December 2016	<a href="http://mn.gov/deed/geo">mn.gov/deed/geo</a>

## Quarterly Employment Demographics (QED)

QED is the newest wage data source, with plans for the dataset to go live on DEED's website in September. QED combines the wage information from Minnesota's unemployment insurance records (the same wage source underlying QCEW) with age and gender data from driver's license records (see Figure 2).

Median and average hourly wage by industry, gender and age is available from QED. Wage data are provided for the state, metro areas, economic development regions, planning regions and counties. Industry detail is three digits and up. The time lag for this dataset is the same as QCEW data (six months) and the data are available back to 2000.

QED can be used to tackle a wide range of labor market issues, including the aging of Minnesota's labor force (see article by Cameron Macht in this issue of Trends). The inclusion of median wage is also an improvement over average wages as reported by QCEW. Median wages in most cases provide a clearer picture of wages across industries, gender or age groups, as average wages can often lead to inaccurate conclusions if wages are highly skewed. QED data show that women have lower median hourly wages than

men in all 20 major industrials sectors.

## Graduate Employment Outcomes (GEO)

If you are interested in wages paid to recent graduates of postsecondary programs, GEO is designed with you in mind. The GEO data link recent graduates of various Minnesota postsecondary programs to their employment histories contained in unemployment insurance files. The oldest data are for employment history, including median hourly wage, for roughly 189,000 people who graduated from a Minnesota postsecondary program between 2006 and 2009 (see Figure 2).

The median wage for these individuals was \$18.30 one year after graduation, \$19.72 after two years and \$23.23 five years after graduation. Each year graduates from the past year are added to the database, with annual updates on their employment outcomes added.

The most recent graduate cohort is individuals who graduated between July 2013 and June 2014. For each cohort, wage data can be explored by award type (four types from certificates to graduate degrees), institution type (five types from private career schools to public, four-year colleges), individual schools (approximately 140 schools)

and type of instruction program (more than 30 programs from agriculture to visual and performing arts).

## American Community Survey (ACS)

For many wage-related requests, the source to consult is ACS data. ACS is the only household-based wage dataset with over 72,000 Minnesota households responding annually as part of the U.S. Census Bureau's ongoing effort to gather detailed demographic, social, economic and housing statistics for all areas in the country (see Figure 3).

Since ACS is a household survey, estimates are by place of residency, unlike the other wage data sources, which are all by place of work. If one wants earnings data for residents of Bloomington, then ACS data are your best bet. But if one wants earnings information of workers working in Bloomington, then QCEW data would be the best choice.

Median wage is available for very smaller geographic areas but only as five-year averages. One-year estimates of median wages are available for larger areas. Wage information is available across a wide range of demographic characteristics, such as age, gender, education attainment and ethnicity. Wage or income

FIGURE 3

	<b>American Community Survey (ACS)</b>	<b>Bureau of Economic Analysis (BEA)</b>	<b>Quarterly Workforce Indicators (QWI)</b>
<b>Description</b>	Median and selected average annual earnings	Quarterly and annual total wages and average wages	Average monthly earnings and total quarterly earnings
<b>Industry or Occupation</b>	Industries and occupations	Industries (two and three SIC and NAICS levels)	Industry (two, three, and four digit NAICS levels), gender, ethnicity, race, education attainment, and age groups
<b>Methodology</b>	Annual survey by U.S. Census covering 2.3 million households across U.S. including roughly 72,000 in Minnesota	Most of the wage estimates are based on QCEW wage data with adjustments made for unreported wages and salaries for certain industries	Unemployment insurance records combined with U.S. Census records
<b>Populations Excluded</b>	None	Self-employed, railroad workers, student workers, elected officials, and most religious organization workers	Self-employed, railroad workers, student workers, elected officials, most religious organizations workers
<b>Currency</b>	Updated annually	Quarterly data available one quarter after end of the quarter with annual wages available with two quarter lag	Quarterly data available six months after the end of the quarter
<b>Historical Availability</b>	Various years depending on geographic detail, most Minnesota statewide data starts in 2005	1958 - 2001 SIC and 1990 - 2012 NAIC	Third quarter 1994
<b>Geographic Detail</b>	U.S., states, MSAs, counties, cities, census tracts	U.S., states, MSAs, sub-state regions, counties, cities	State, counties, micro/metropolitan areas, workforce service areas
<b>Advantages</b>	Fine geographic detail with wage data available for many demographic characteristics such as education attainment, ethnicity, disability status, class of worker status, and age	Wage data back to 1969 although the industry classification system changes in 2001, average proprietors' income by industry which is an estimate of annual average wage for self-employed	Wage data by worker characteristics (gender, age, race, ethnicity, and education) and by firm characteristics (firm age and firm size)
<b>Limitations</b>	Nine to twelve month time lag and small area data available only as five-year averages	One quarter lag on quarterly total wages, six month lag on state average annual wages, and one year lag on county average annual wage, calculations required for industry level annual average wages	Three quarter time lag
<b>Links</b>	<a href="http://factfinder2.census.gov/">http://factfinder2.census.gov/</a>	<a href="http://www.bea.gov/regional/index.htm">http://www.bea.gov/regional/index.htm</a>	<a href="http://lehd.ces.census.gov/applications/qwi_online/">http://lehd.ces.census.gov/applications/qwi_online/</a>

estimates for self-employed workers are provided by the ACS since households are asked about their class of work status (employed in a wage and salary job or self-employed).

Self-employed earnings can be a significant share of total income, depending on an area's mix of industries. They are only available from ACS or BEA data.

Minnesotans reported through the ACS that the 2014 median annual wage was \$35,700 for private for-profit company workers, \$47,300 for self-employed in own incorporated business workers, and \$26,000 for self-employed in own not incorporated business workers.

### **Bureau of Economic Analysis (BEA)**

BEA wage data have two main advantages. First, the data go back to 1958 for Minnesota's roughly 90 industries (one-, two- and three-digit SIC industries). The older data, through 2000, are based on the SIC industry classification, while data after 2000 are based on the NAICS industry classification. Average annual wage by industry is available from 1969 forward, with only total industry wage available for earlier years. BEA's data tool is well-designed, making data downloading easy, which is its other main advantage (see Figure 3).

BEA wage data are based mainly on QCEW wage data, but certain industries have their wage totals revised upwards by the BEA to account for under-reported earnings. BEA earnings data are the only other source of self-employed earnings data besides ACS. Self-employed earnings by industry are reported as proprietor's income obtained through tax returns.

BEA wage data are invaluable for researchers looking for wage changes across industries and regions from a long-term perspective. For example, state and local government workers in Minnesota accounted for 11.2 percent of all wages and salaries paid to Minnesota wage and salary workers in 1958. That percent jumped to 15.6 percent by 1972 and then tailed off to 11.3 percent in 2015. Blame the baby boomers school years for the 1972 peak percentage.

### **Quarterly Workforce Indicators (QWI)**

An innovative wage source is the Quarterly Workforce Indicators compiled by the U.S. Census Bureau. QWI is useful for analysts interested in addressing labor market trends across time and regions and certain demographic variables (see Figure 3).

Workers' wage data, compiled from unemployment insurance

files, are matched with demographic characteristics of workers and the firms employing them that the Census Bureau already has on record. The average monthly earnings by age, gender, education attainment, race and ethnicity of workers across industries is aggregated into several industrial levels. The data are available by two-, three- and four-digit industries. Average monthly earnings by firm age and firm size (in terms of number of employees) across industries are also available.

QWI data can be used to see the age distribution of workers across industries, helping to identify which industries are top heavy with older workers and likely to be ramping up hiring as their workers retire. QWI wage data by education attainment show that Minnesota workers with bachelor's degrees or higher earned on average \$6,170 monthly during the third quarter of 2015, compared with the \$3,545 average monthly earnings of workers with only a high school degree. That works out to an 86 percent wage premium for college educated workers.

Many, although not all, wage-related issues or questions can be answered by examining the various wage data reviewed here. Understanding how the wage sources vary is essential to arriving at the right answers. **T**



## Putting Wage Data to Work

### Currently Employment Statistics (CES)

"Job Hours and Pay," **Minnesota Employment Review**, November 2013  
[www.mn.gov/deed/newscenter/publications/review/november-2013/jobs-hours-pay.jsp](http://www.mn.gov/deed/newscenter/publications/review/november-2013/jobs-hours-pay.jsp)

### Occupational Employment (OES)

"Real Wage Growth by Occupation," **Minnesota Employment Review**, August 2015  
[www.mn.gov/deed/newscenter/publications/review/august-2015/real-wage-growth.jsp](http://www.mn.gov/deed/newscenter/publications/review/august-2015/real-wage-growth.jsp)  
"Regional Wage Comparisons," **Minnesota Employment Review**, November 2015  
[www.mn.gov/deed/newscenter/publications/review/november-2015/regional-wage-comparisons.jsp](http://www.mn.gov/deed/newscenter/publications/review/november-2015/regional-wage-comparisons.jsp)

### Quarterly Census of Employment and Wages (QCEW)

"The Changing Face of Minnesota Manufacturing," **Minnesota Economic Trends**, December 2014  
[www.mn.gov/deed/newscenter/publications/trends/december-2014/manufacturing.jsp](http://www.mn.gov/deed/newscenter/publications/trends/december-2014/manufacturing.jsp)

### Job Vacancy Survey (JVS)

"What's Happening to Middle-Wage Jobs?" **Minnesota Employment Review**, August 2012  
<http://cdm16105.contentdm.oclc.org/cdm/compoundobject/collection/p15453coll4/id/5016/rec/24>

### Graduate Employment Outcomes (GEO)

"Helping Students Make Educational Choices," **Minnesota Economic Trends**, September 2014  
[www.mn.gov/deed/newscenter/publications/trends/september-2014/educational-choices.jsp](http://www.mn.gov/deed/newscenter/publications/trends/september-2014/educational-choices.jsp)  
"Where Are the Jobs for Recent College Graduates?" **Minnesota Employment Review**, July 2015  
[www.mn.gov/deed/newscenter/publications/review/july-2015/where-are-the-jobs.jsp](http://www.mn.gov/deed/newscenter/publications/review/july-2015/where-are-the-jobs.jsp)

### Quarterly Workforce Indicators (QWI)

"Stuck in Neutral," "Wage and Employment Disparities for Minority Workers" and "Diversity in Greater Minnesota," **Minnesota Economic Trends**, December 2015  
[www.mn.gov/deed/newscenter/publications/trends/december-2015/](http://www.mn.gov/deed/newscenter/publications/trends/december-2015/)

### American Community Survey (ACS)

"Change in Income by Education Level, by Race in Minnesota," Minnesota Private College Research Foundation, July 2010  
[www.mnprivatecolleges.org/sites/default/files/downloads/Research\\_Brief\\_educ\\_income\\_race.pdf](http://www.mnprivatecolleges.org/sites/default/files/downloads/Research_Brief_educ_income_race.pdf)

### Bureau of Economic Analysis (BEA)

"Show Me the Money," **Minnesota Economic Trends**, September 2015  
[www.mn.gov/deed/assets/sept-2015-trends-money\\_tcm1045-209655.pdf](http://www.mn.gov/deed/assets/sept-2015-trends-money_tcm1045-209655.pdf)



Meet

# THE WRITERS



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